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Before the
FEDERAL COMMUNICATIONS COMMISSION
Washington, D.C. 20554

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In the Matter of	)	GN Docket Nos. 09-47, 09-51, and 09-137
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Comments – NBP Public Notice #27	)	CS Docket No. 97-80
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TEXAS INSTRUMENTS COMMENTS – NBP PUBLIC NOTICE #27

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Texas Instruments Incorporated ("Texas Instruments") is pleased to submit comments in response to the Commission's NBP Public Notice #27 addressing video device innovation. The Commission has already established the foundation for video innovation by adopting the robust and powerful IEEE-1394 network interface standard for set-top boxes. The obstacle to video device innovation is not the absence of a standard but rather the refusal of service providers to furnish an open platform and fully enable the existing features of IEEE-1394. The current software in cable operator set-top boxes does not allow bi-directional functionality on the IEEE-1394 port for controlling or receiving video. This effectively restricts the ability of consumers to benefit from the powerful capabilities of IEEE-1394. For example, the ability to change the channel, access the program guide, control the set-top box, play recorded videos, seamlessly access the Internet, or view Internet content with consumer-provided, IEEE-1394 equipped devices is disabled. This stifles the ability of consumer electronics manufacturers to innovate. If the Commission merely would require service providers to enable the existing bi-directional features of IEEE-1394 it will go a long way toward spurring the development of a retail market for nationally portable video devices that will work across all delivery platforms.

As the Commission has observed, the convergence of the television and content delivered by Internet protocol ("IP") will be spurred by a set-top device that will work across all delivery

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platforms. IEEE-1394 provides that capability now. To date over a billion IEEE-1394 ports have been shipped and they are found in a large variety of consumer electronics and personal computers. As a true peer-to-peer interface, IEEE-1394 is ideal for home networking, as demonstrated by its use in the High Definition Audio/Video Networking Alliance ("HANA") standard for home networking. IEEE-1394 is also an ideal Internet two-way broadband network interface for video; it efficiently transfers IP packets, bulk data and true isochronous data.

I. THE IEEE-1394 PORT AND THE HANA STANDARD ARE THE IDEAL SOLUTION FOR MULTIMEDIA HOME NETWORKING.

The HANA standard enables consumers to easily connect all of their HANA devices using just one cable and access them with just one remote. This frees the consumer from the existing complexities and time-consuming set-up procedures that impact the enjoyment of the HD experience.

The cornerstone of HANA is the IEEE-1394 port, also known as iLink (Sony), Firewire (Apple), and DV (Samsung). The Commission requires that set-top boxes distributed by cable operators to their customers include an IEEE-1394 interface.[1] The Commission chose the IEEE-1394 standard because the consumer electronics and cable industries recognized its technological superiority.[2] IEEE-1394 has many advantages and inherent capabilities.

IEEE-1394 is fast. In today's set-top boxes, IEEE-1394 operates at 400 Mbps. IEEE-1394 ports operating at 800 Mbps and 1600 Mbps are already on the market.

IEEE-1394 is a true peer-to-peer network. IEEE-1394 is a true peer-to-peer network, supporting up to 63 devices. IEEE-1394 permits mixed cable topologies using twisted/shielded

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[1]   *See* 47 C.F.R. § 76.640(b)(4).

[2]   *See Implementation of Section 304 of the Telecommunications Act of 1996; Commercial Availability of Navigation Devices; Compatibility Between Cable Systems and Consumer Electronics Equipment*, Further Notice of Proposed Rulemaking, 18 FCC Rcd. 518 (2003).

pair cable, CAT5 cable, coaxial cable, and/or optical fiber. These devices can be hot-plugged in a daisy chain or star topology without the need for a central processor to manage the functions. Ethernet on the other hand requires a single device acting as a "host" for managing the network which is processor-intensive, inefficient, and costly.

IEEE-1394 has an efficient architecture. IEEE-1394 does not uncompress or change MPEG-compressed data (such as video-over-IP); the port either streams the data between devices in its native MPEG-compressed form or sends it directly to the set-top box, where it is uncompressed by the decoder in the set-top box and passed on via the HDMI interface to the digital television for display. The significance of this architecture is that the need for costly memory buffers and central processing units are minimized for the transmission of content.

IEEE-1394 provides guaranteed quality-of-service. IEEE-1394 can support five (or more) simultaneous high-definition video streams at 400 Mbps, which makes IEEE-1394 ideal for simultaneous display and recording. Because IEEE-1394 was designed from the ground up with true isochronous streaming services and the concept of an "isochronous resource manager" for moving video content, it can provide a guaranteed quality of service not available in an Ethernet system. IEEE-1394 is able to assign speeds to devices based on their capabilities. Because of its low overhead, IEEE-1394 makes available 87% of bandwidth for use (which is significantly better than Ethernet).

IEEE-1394 protects content. HANA's architecture incorporates digital rights management and watermark verification of copyrighted content. This architecture respects the rights of content owners, multichannel video service providers, and broadcasters. IEEE-1394's DTCP encryption protocol has been approved by the Motion Picture Association of America, CableLabs, and the DVD Copy Control Association. IEEE-1394's DTCP encryption is a proven

technology that requires very little CPU processing, because the technology is embedded in the device.

IEEE-1394 is widely used. By April 2008 more than one billion IEEE-1394 ports had shipped worldwide. IEEE-1394 network interfaces are found in set-top boxes, in personal and notebook computers, in DVD recorders, in camcorders, and in many other consumer and computer devices.

IEEE-1394 is upgradeable. IEEE-1394 is software upgradeable, so that deployed units can be updated in the future with new services and features.

In short, IEEE-1394 is robust, powerful, and the best network interface for multimedia innovation and Internet broadband access. That is why the HANA standard uses IEEE-1394. If the Commission's goal is to increase broadband use and give consumers maximum flexibility with respect to video content (whether or not delivered by IP), the Commission does not need another standard. The Commission already has a solution – IEEE-1394.

II. THE CONSUMER, NOT THE CABLE OPERATOR, SHOULD CONTROL WHAT PROGRAMMING IS SEEN ON THE HOME NETWORK.

The convergence of the television and content delivered by IP will be spurred by a set-top device that will work across all delivery platforms, including cable operator and broadband-based video platforms. The key to achieving this convergence is a set-top device which allows the consumer, not the cable operator, to control what programming is seen and how it is manipulated. The consumer should be able to choose what device to use for viewing content – whether that content comes over the Internet, from a Blu-Ray player, or from a consumer's DVR – and have that device work seamlessly with the navigation menu of the cable system. Consumer demand for broadband will increase if the service provider is required to enable the bi-directional functionality of IEEE-1394. Simply put, consumers will perceive the compelling

value of being able to control a converged platform to receive, move, share, and distribute video content from various sources.

Today the IEEE-1394 bus, designed to provide a two-way interface, is in millions of homes. Yet cable multiple system operators ("MSOs") currently use software to only enable content to move in one direction – out of the set-top box. The software on the set-top box disables the capability of the IEEE-1394 port, which prevents the consumer from controlling or sending content into the set-top box. These limitations on the IEEE-1394 port are not due to its capability or that of the set-top box hardware, but rather to the MSO software disabling the inherent capability of the port. This effectively prevents anyone other than the cable MSOs from providing value-added services.

The best thing for consumers would be an open set-top box platform. A product that attaches to and authenticates into the home network should be required to be an open platform and interoperable within the network. The intent of the FCC has been to standardize interfaces around HDMI/DVI and IEEE-1394, to allow networking with customer premises equipment purchased at retail so that viewers could control their viewing experience. Today, the hardware capability is in place in set-top boxes in millions of American homes with software upgradable IEEE-1394 ports. Texas Instruments recommends that the Commission require the cable MSOs to software-enable the bi-directional capabilities of deployed set top boxes and that the Commission require all newly shipped set-top boxes to be equipped with fully enabled IEEE-1394 ports. This approach would allow users of existing set-top boxes, as well as future users, to benefit from the video device innovation which will surely follow. Most excitingly users will be able to access the Internet in a seamless manner on their TV, using hardware already in their homes supplemented by inexpensive store-bought hardware.

III. THE COMMISSION SHOULD NOT FRAGMENT THE MARKET WITH A NEW STANDARD.

In IEEE-1394, the Commission already has a technologically advanced network interface standard that is well-suited for the convergence of television and IP. The Commission should not fragment the market by mandating a new standard. While the Commission should not prohibit manufacturers and service providers from promoting other network interfaces or other home networking standards, there is no reason to abandon the existing standard. To do so would cause compatibility problems with deployed systems and increase cost.

The HANA home networking standard, using IEEE-1394, provides tremendous benefits to consumers, content providers, and consumer electronics manufacturers. Viewers can view, pause, and record more than five HD channels simultaneously. Significantly, with HANA the consumer can control all audio-video devices and access content with just a single remote per room. HANA also allows consumers to use just a single cable to connect devices rather than multiple cables between all devices.

The HANA standard protects content. HANA's architecture incorporates digital rights management and watermark verification of copyrighted content. In addition, the HANA standard also guarantees interoperability. Because IEEE-1394 products adhere to the baseline standard, there is interoperability with existing products. This promotes innovation in video devices.

If this Commission were to adopt another network interface standard (or adopt a home networking standard using a different network interface), it would not solve the problem that has slowed the growth of IEEE-1394. Innovation will be stymied for as long as cable operators are allowed to use the set-top box to maintain control of the viewer experience.

CONCLUSION

The Commission can encourage innovation in the market for video devices by requiring cable operators to enable bi-directional functionality in the set-top box. The Commission has already adopted the robust and powerful IEEE-1394 network interface standard for set-top boxes. To achieve the convergence of television and content delivered by IP, consumers need devices which allow them, rather than cable operator, to control what is available on the home network.

Respectfully submitted,

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December 21, 2009